

FIG. 1

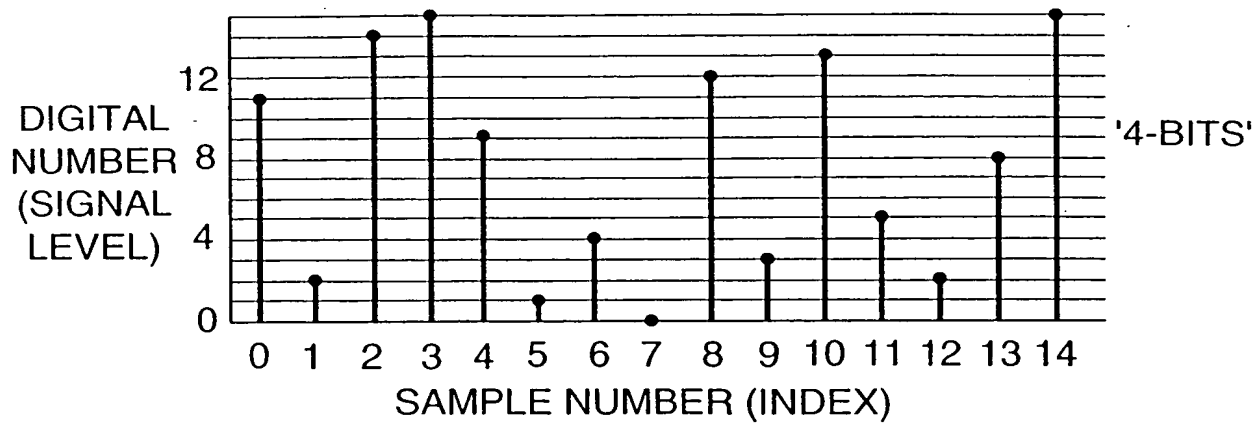
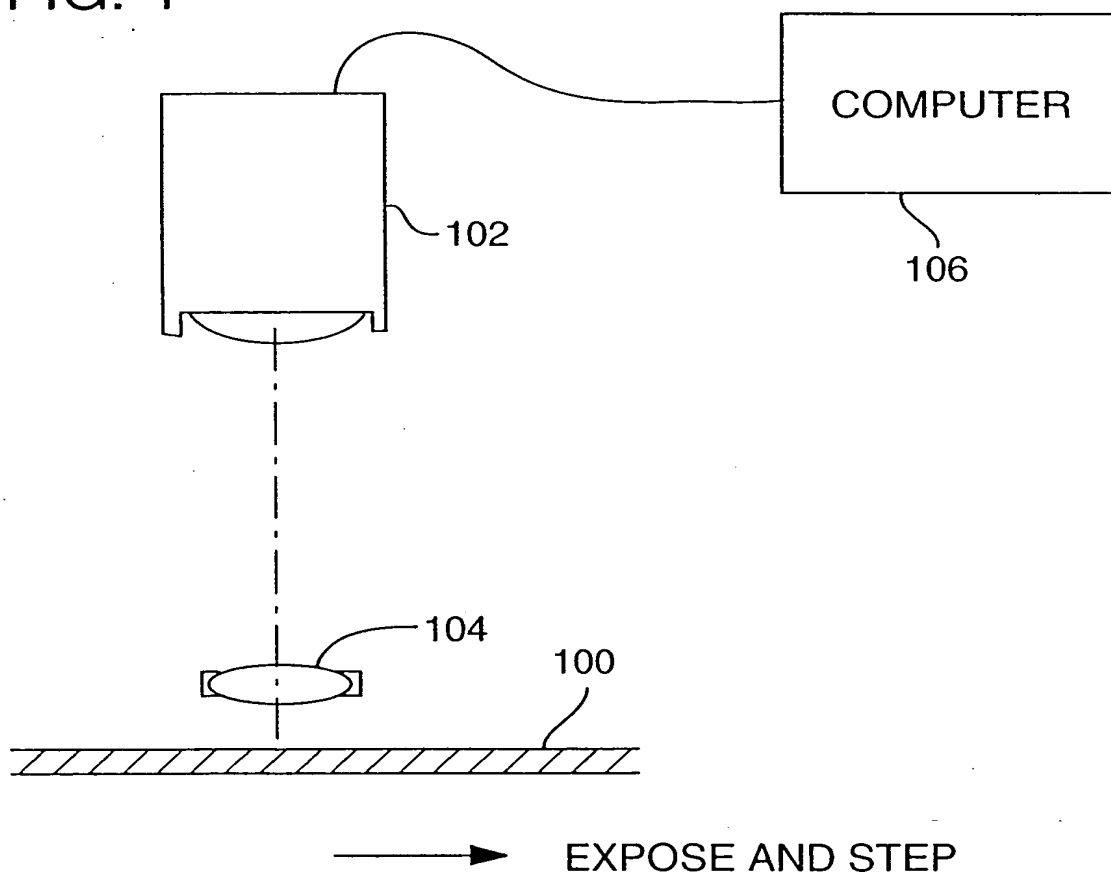


FIG. 4



007650 926860

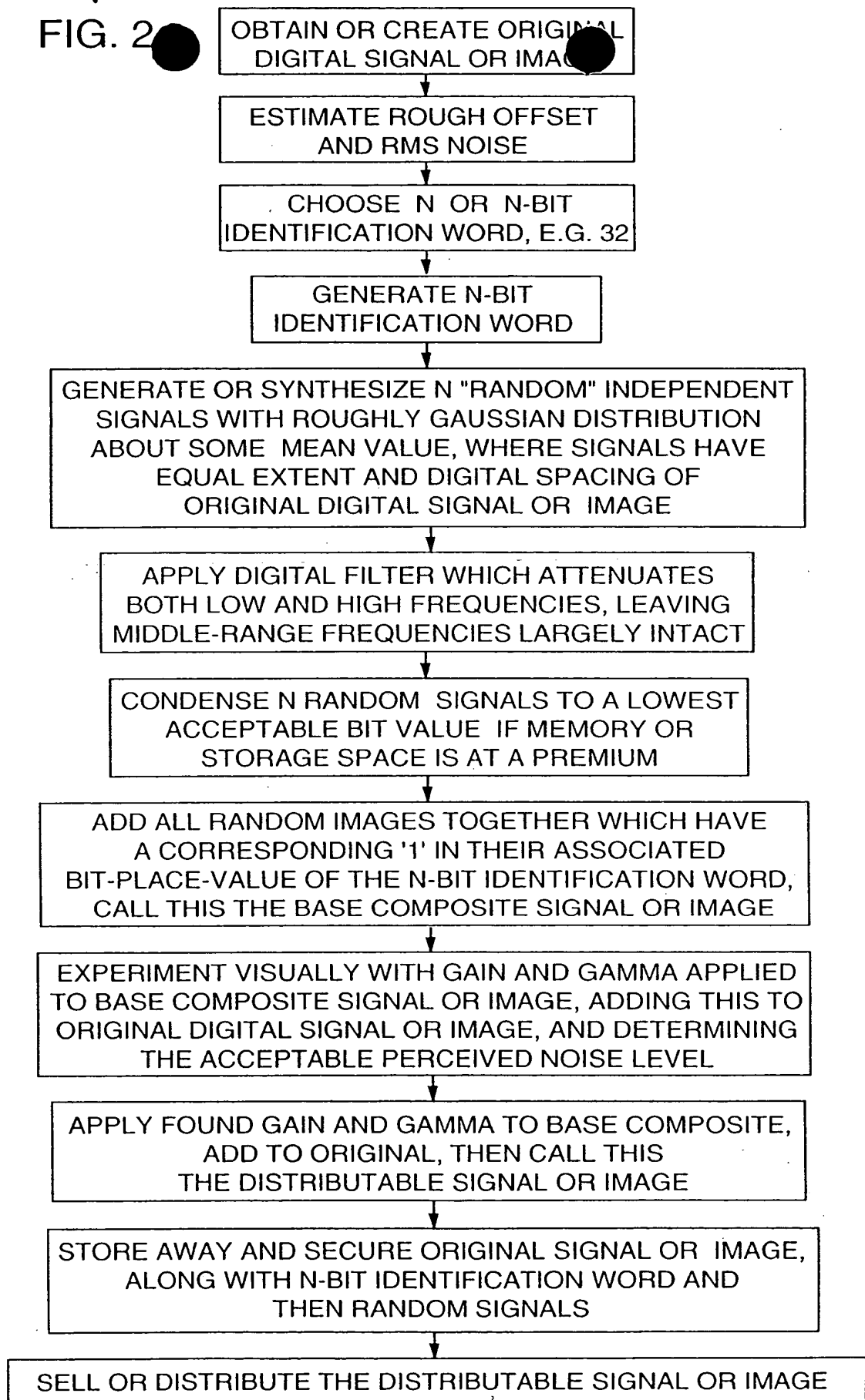


FIG. 3

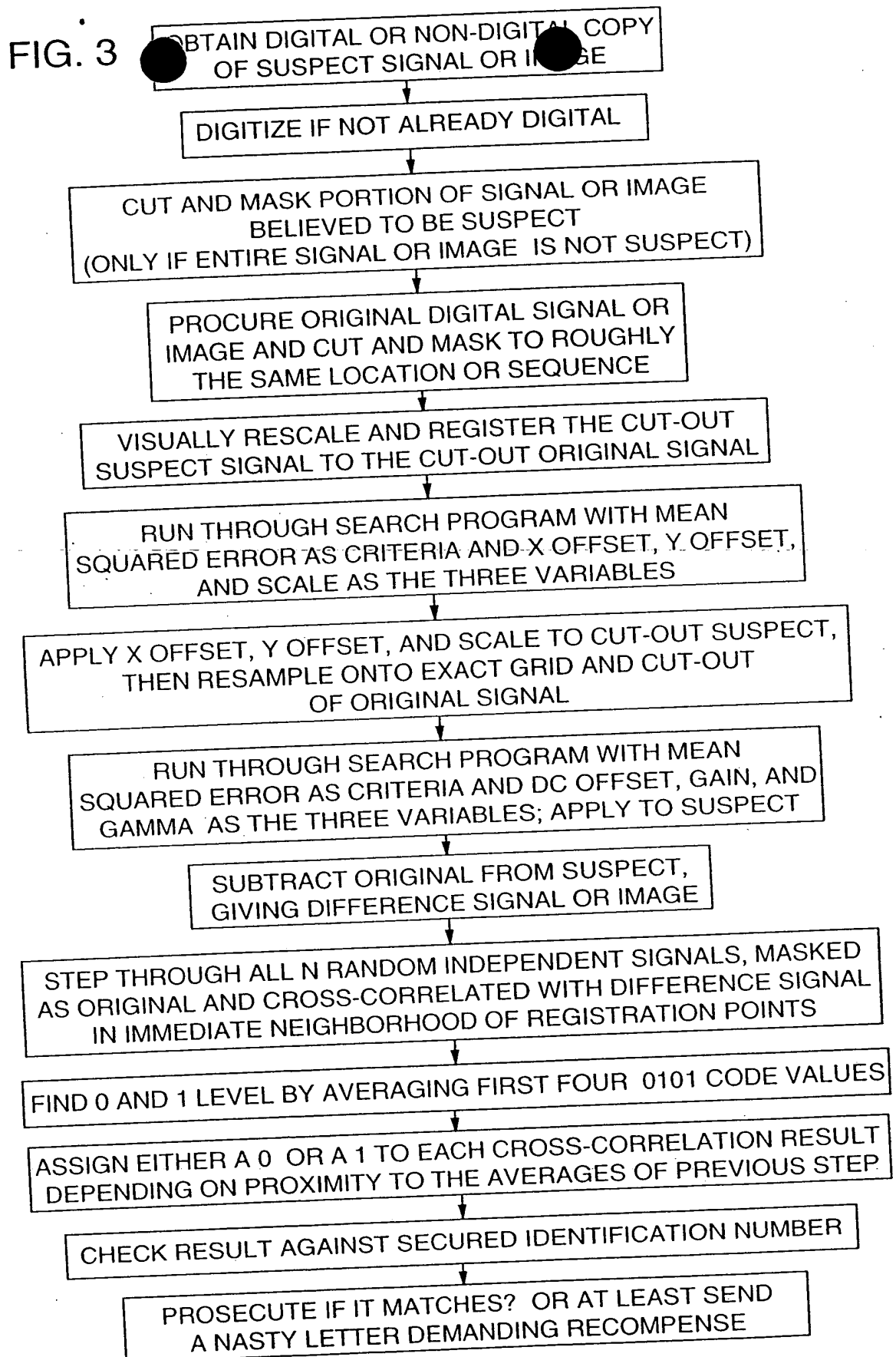


FIG. 5

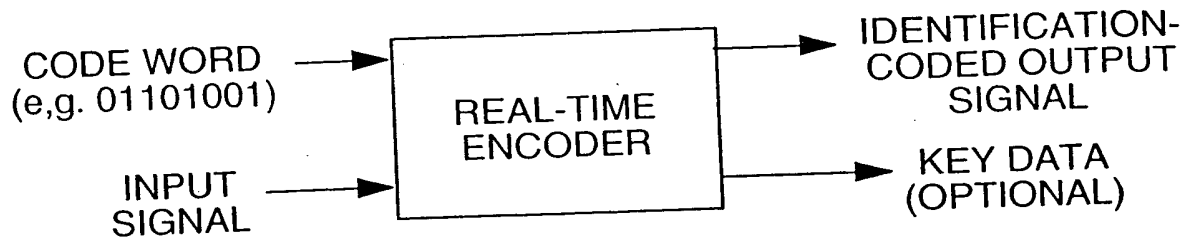
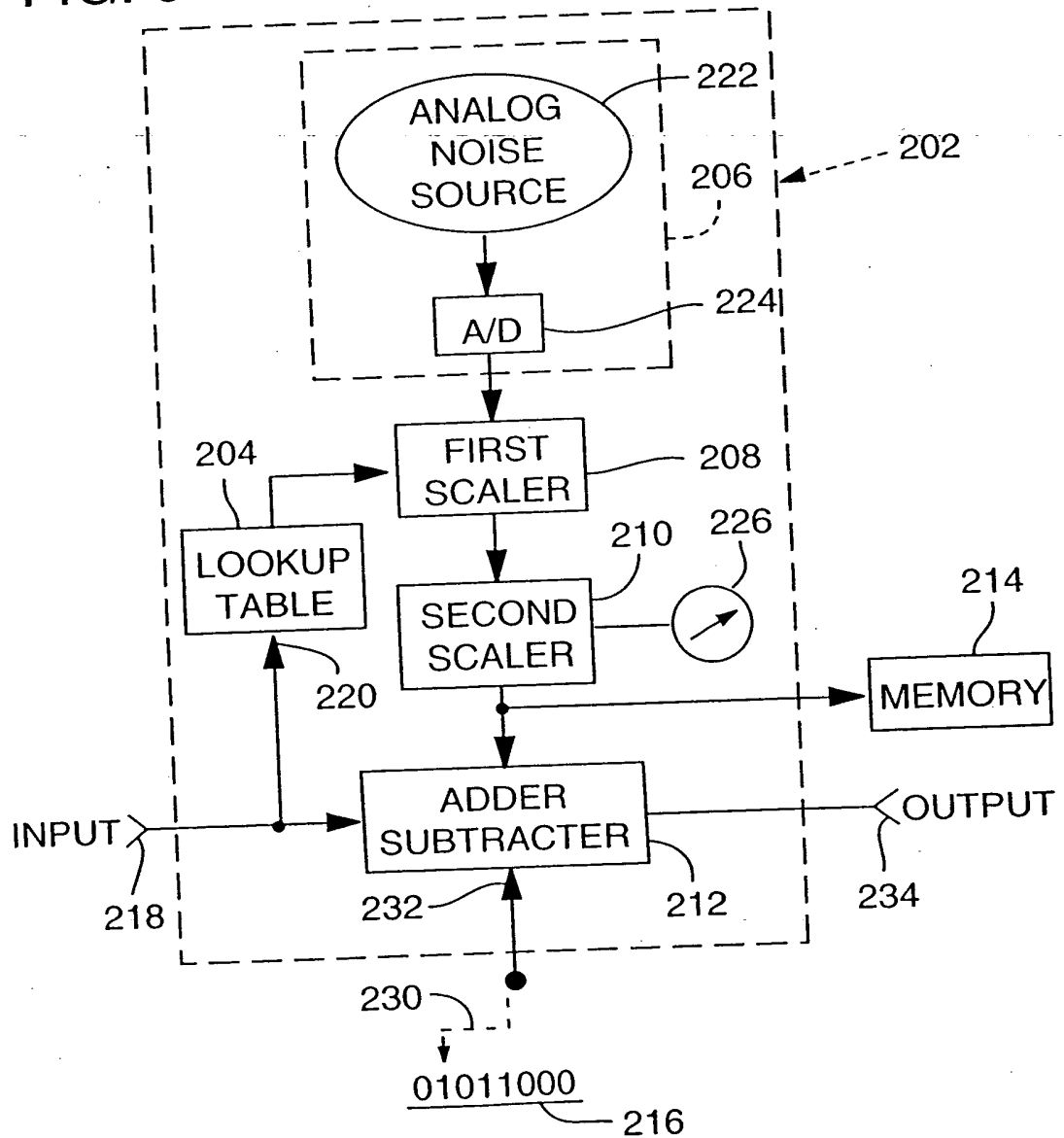


FIG. 6



000005400

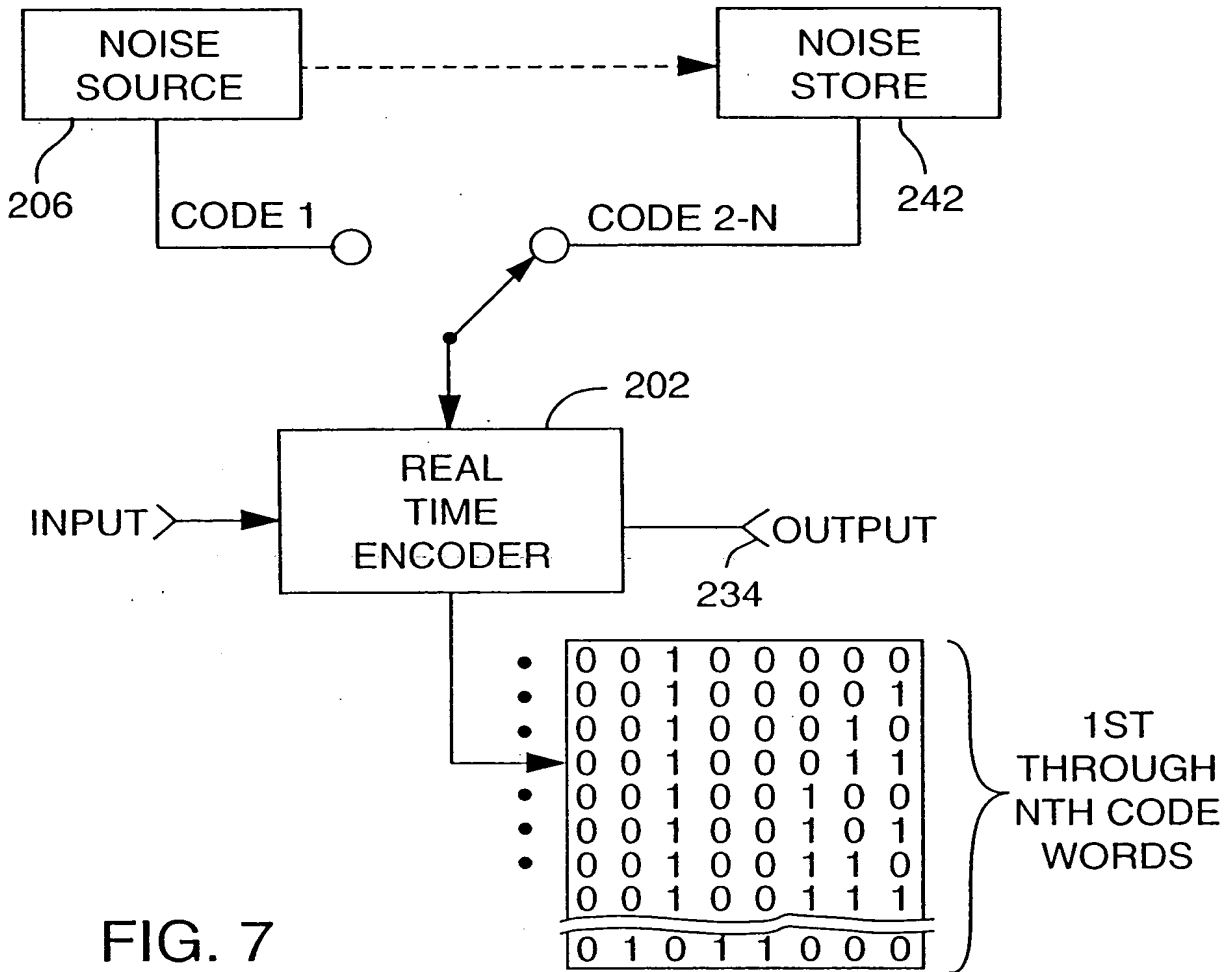


FIG. 7

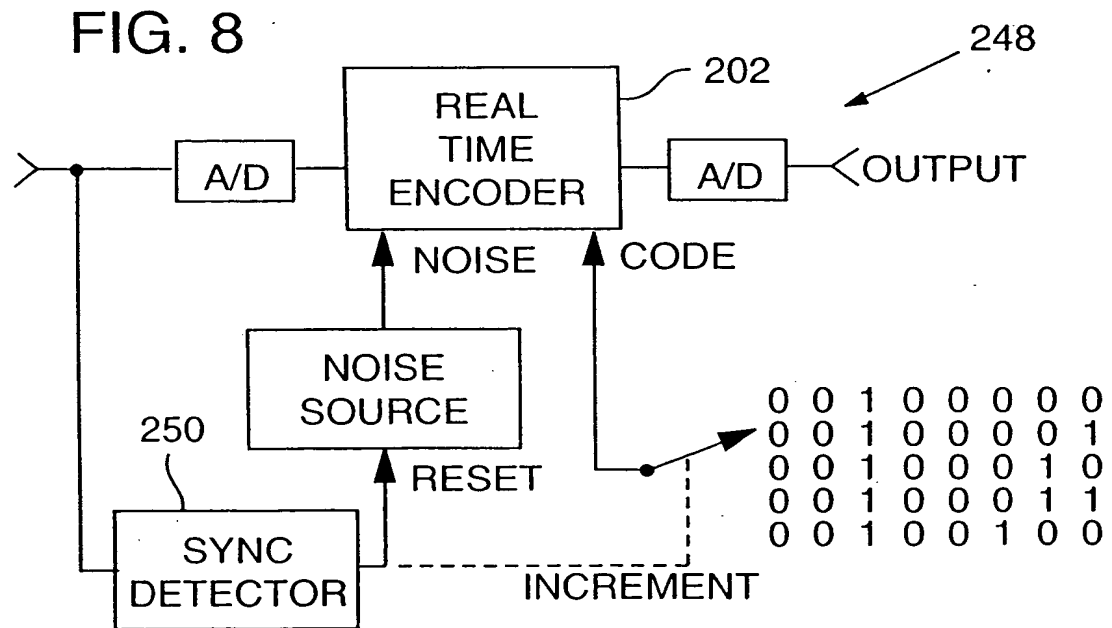


FIG. 8

FIG. 9A

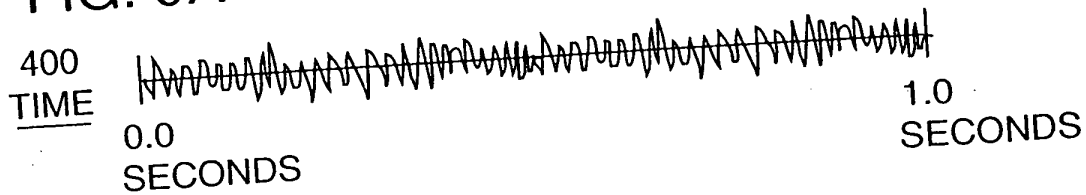


FIG. 9B

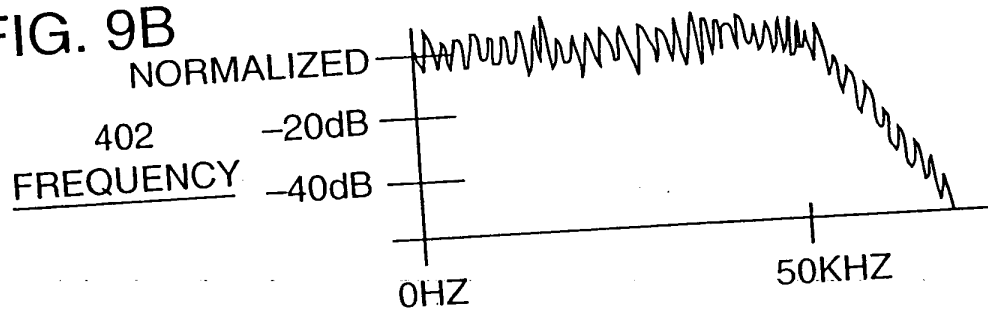


FIG. 9C

BORDER  
CONTINUITY  
404

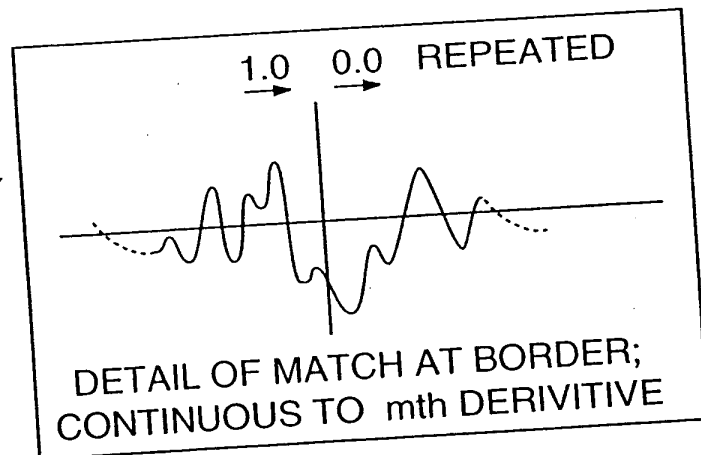


FIG. 10

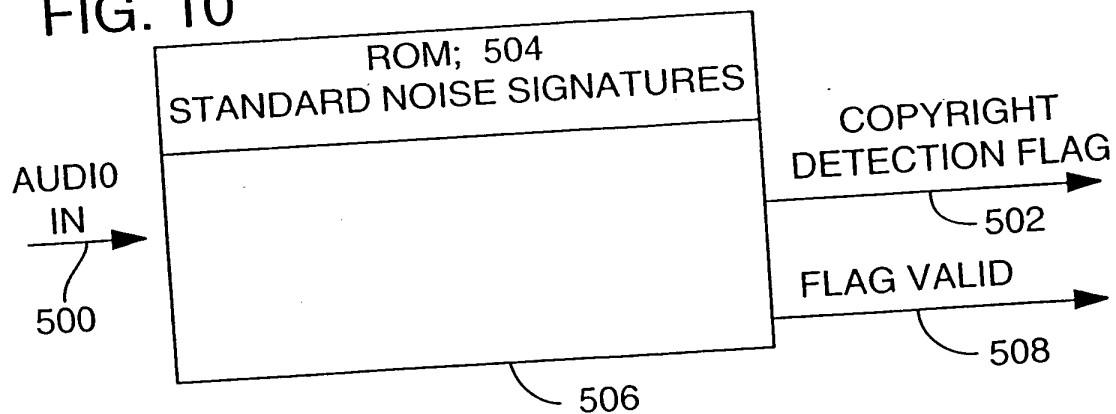


FIG. 11

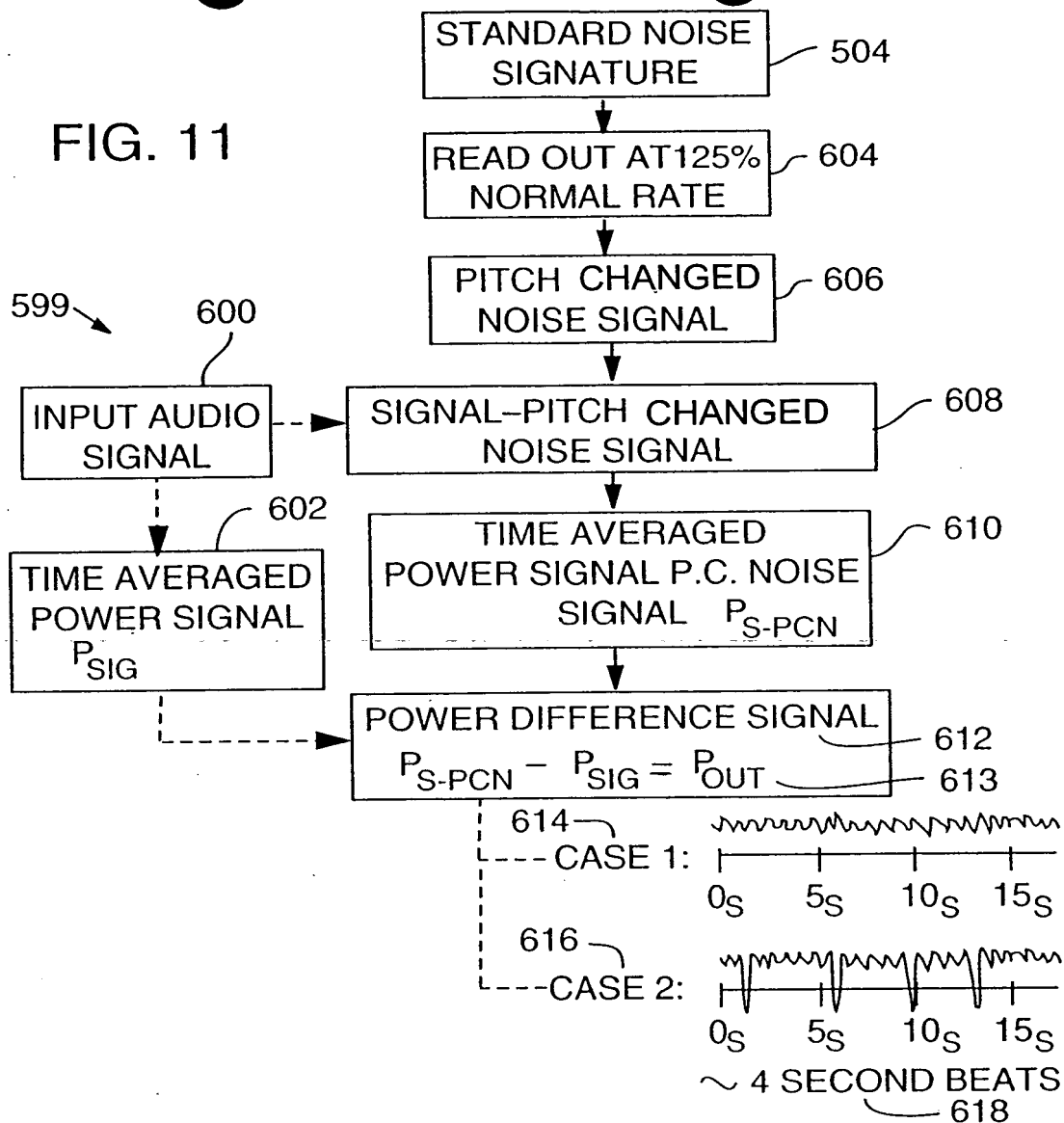


FIG. 12

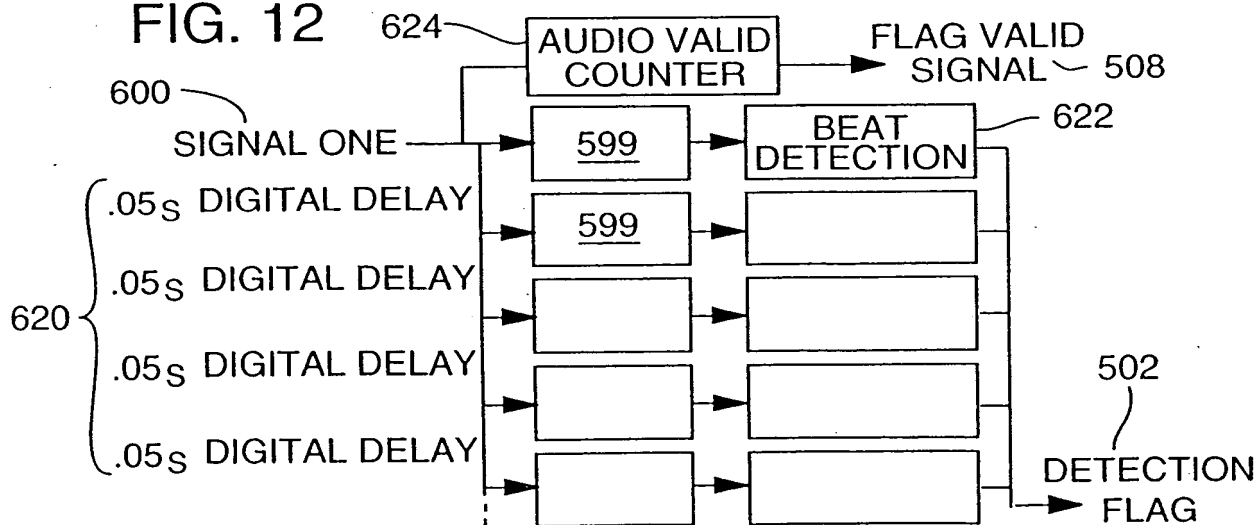
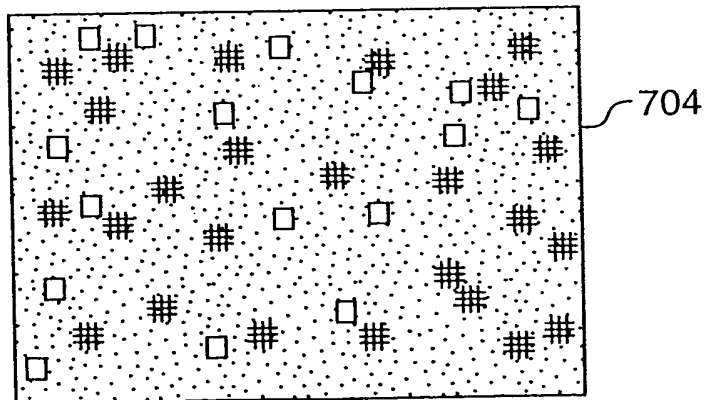
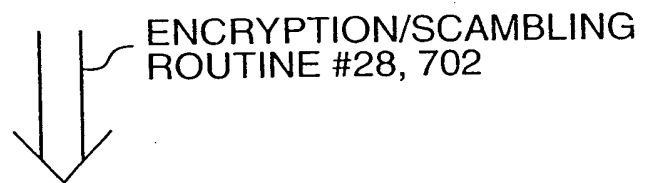
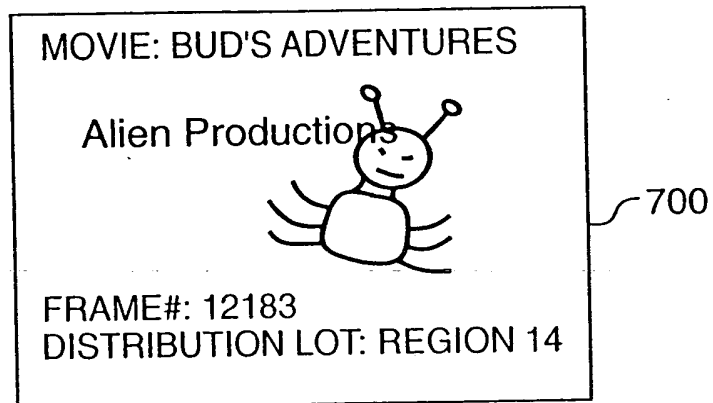


FIG. 13



PSEUDO-RANDOM MASTER SNOWY IMAGE  
(SCALED DOWN AND ADDED TO FRAME 12183)



A line graph with a vertical axis and a horizontal axis. A sharp, narrow peak rises from the horizontal axis, labeled 'EMBEDDED' with an arrow pointing to its apex. Below the peak, a broad, low-amplitude base is labeled '720 DIFFERENCE' with an arrow pointing to it.

722

DIFFERENCE

EMBEDDED

THRESHOLDING

## 722, MEAN-REMOVED HISTOGRAMS OF FIRST DERIVATIVES (OR SCALAR GRADIENTS IN CASE OF AN IMAGE)

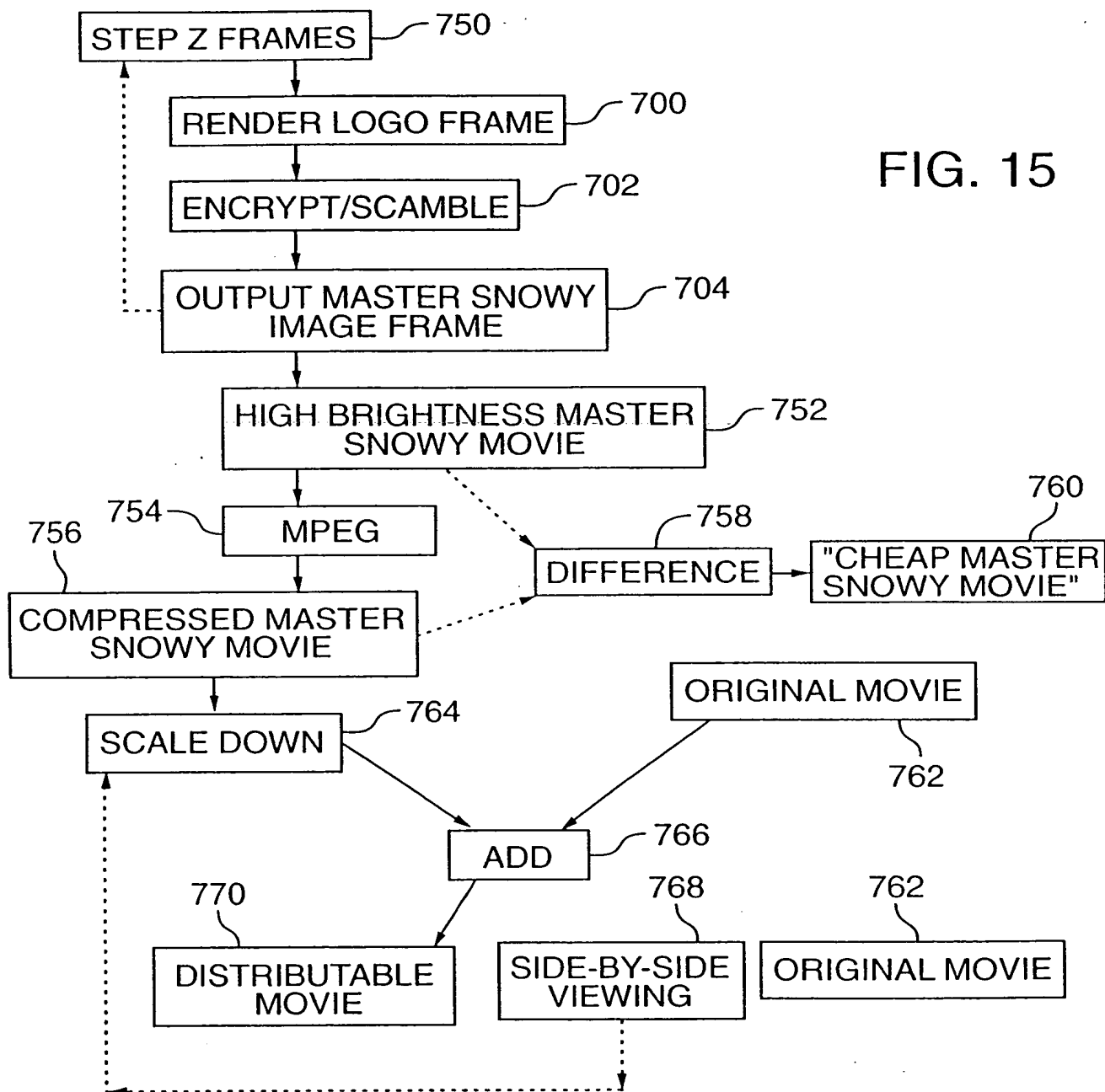
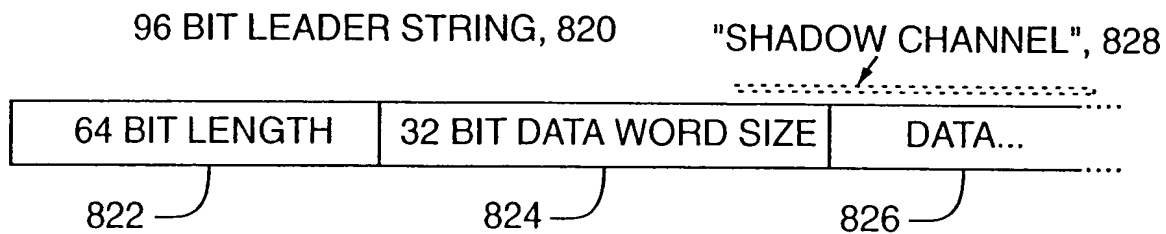




FIG. 17



UNIVERSAL EMPIRICAL DATA FORMAT.

FIG. 18

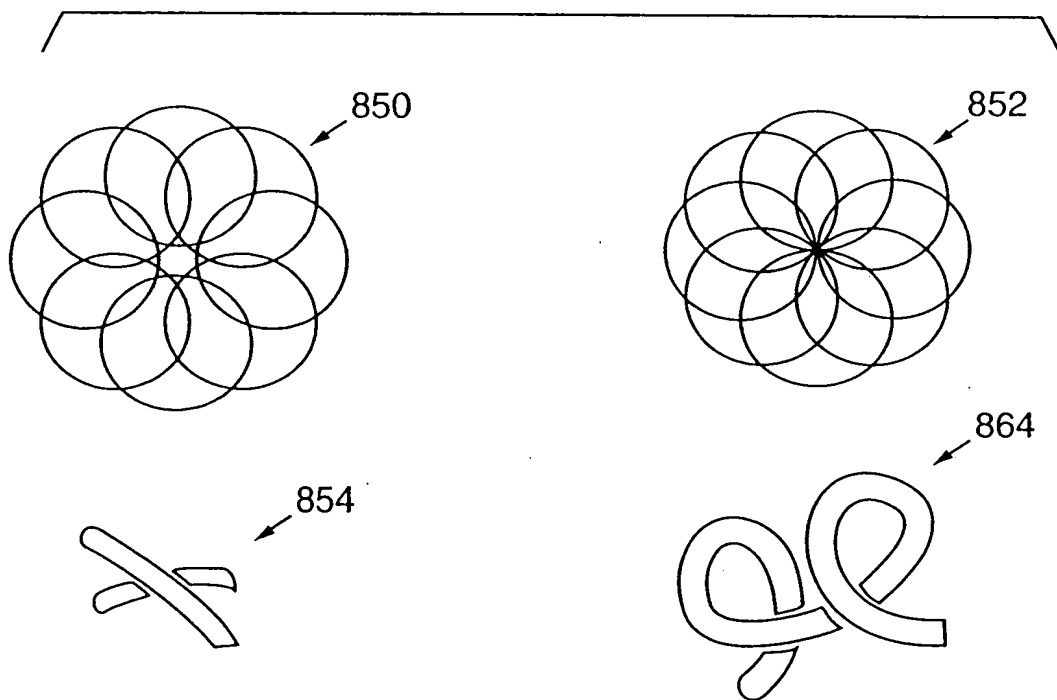
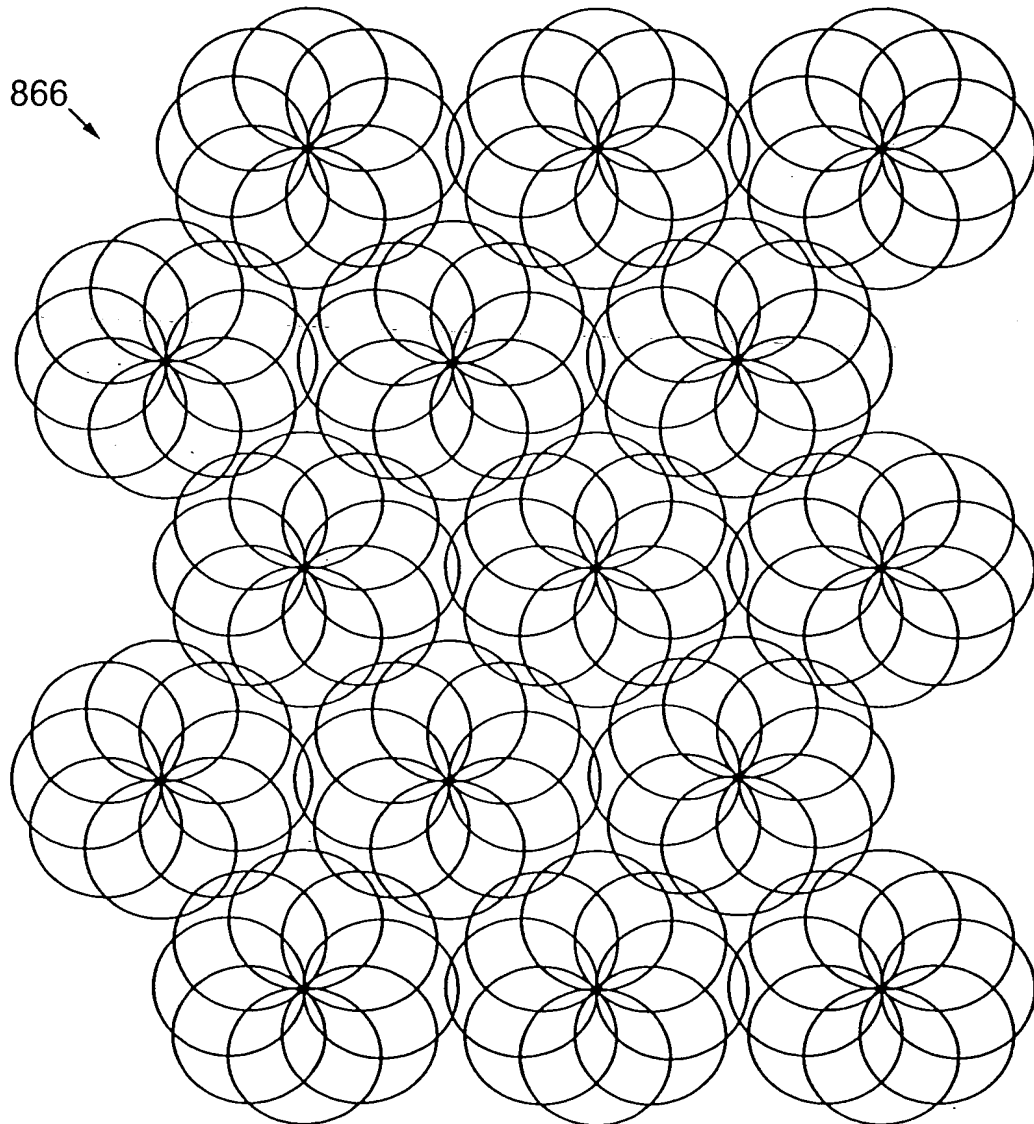


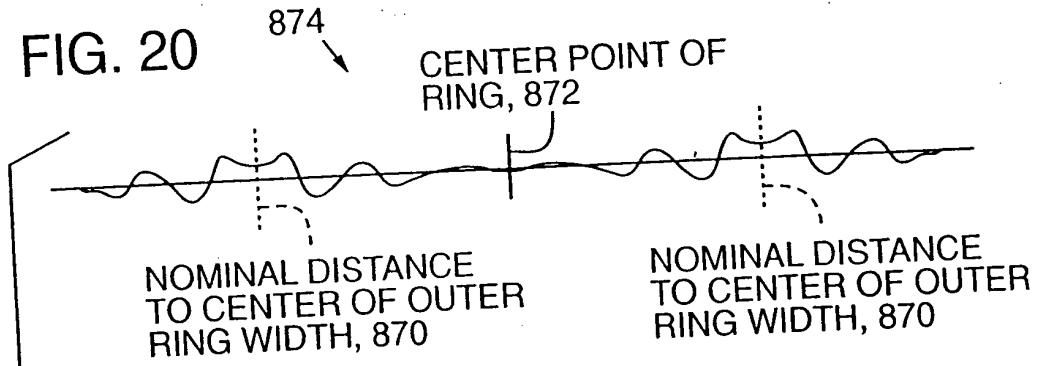
FIG. 19



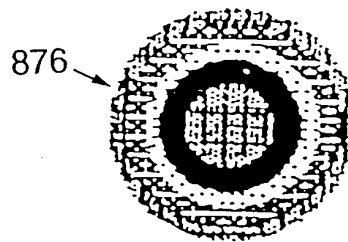
QUEST FOR MOSALCED KNOT PATTERNS WHICH "COVER" AND  
ARE COEXTENSIVE WITH ORIGINAL IMAGE;  
ALL ELEMENTAL KNOT PATTERNS CAN CONVEY THE SAME  
INFORMATION, SUCH AS A SIGNATURE, OR EACH CAN CONVEY A  
NEW MESSAGE IN A STEGANOGRAPHIC SENSE

001E50:62298560

FIG. 20



2-D BRIGHTNESS OF PHASE-ONLY FILTERED RING IS SIMILAR TO THE ABOVE BRIGHTNESS PATTERN ROTATED ABOUT CENTRAL POINT OF RING:



001250-90258560

FIG. 21A

900 →

C	2C	C
2C	4C	2C
C	2C	C

WHERE  $C = 1/16$

ELEMENTARY BUMP  
(DEFINED GROUPING OF PIXELS WITH  
WEIGHT VALUES)

FIG. 21B

...	2		3		4		5		6		7		0	...
...	6		7		0		1		2		3		4	...
...						C	2C	C						...
...	2		3		4	2C	4C	2C	6		7		0	...
...						C	2C	C						...
...	6		7		0		1		2		3		4	...
...														...

EXAMPLE OF HOW MANY ELEMENTARY BUMPS, 900, WOULD BE ASSIGNED LOCATIONS IN AN IMAGE, AND THOSE LOCATIONS WOULD BE ASSOCIATED WITH A CORRESPONDING BIT PLANE IN THE N-BIT WORD, HERE TAKEN AS  $N=8$  WITH INDEXES OF 0-7. ONE LOCATION, ASSOCIATED WITH BIT PLANE "5", HAS THE OVERLAY OF THE BUMP PROFILE DEPICTED.

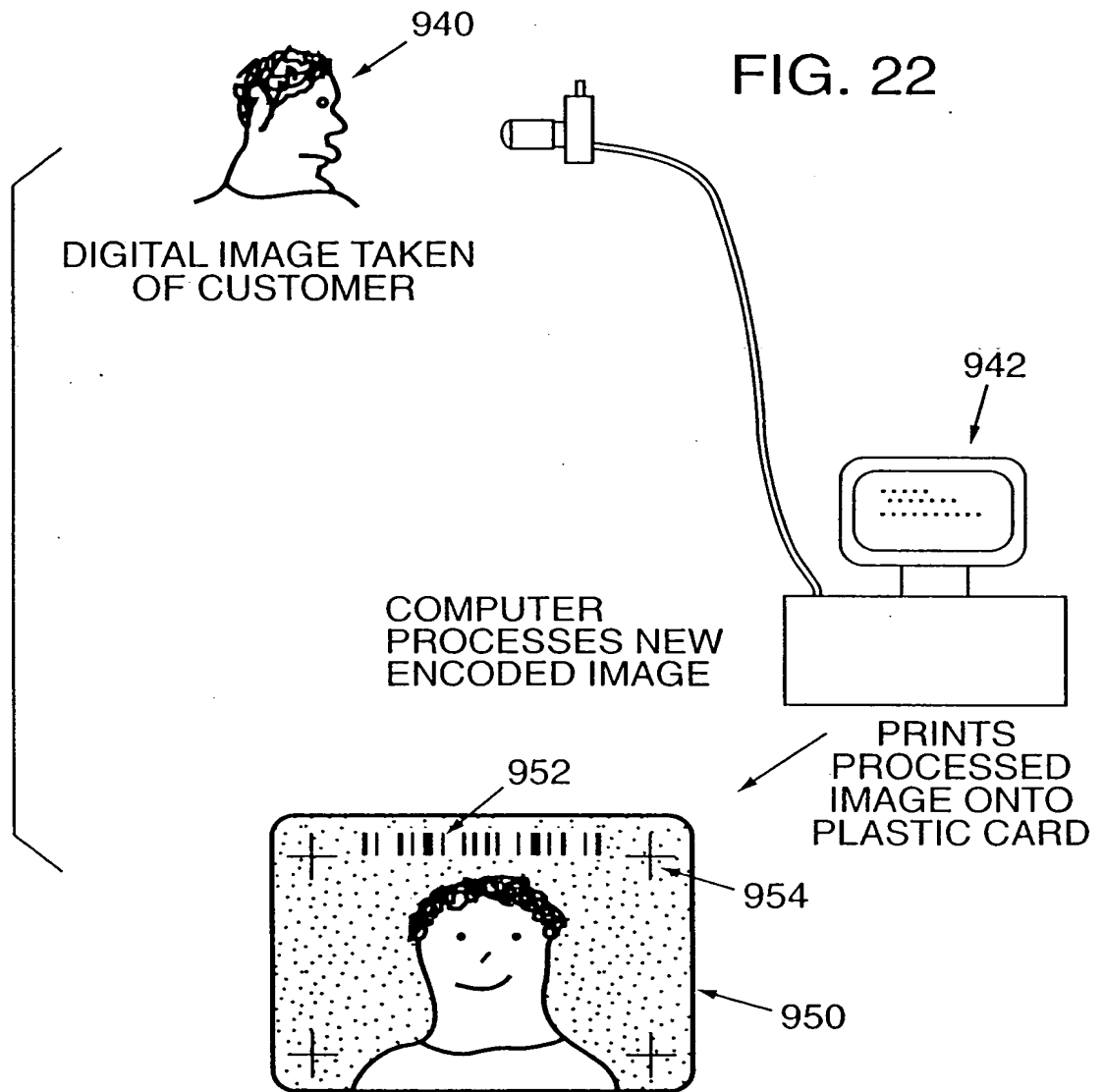
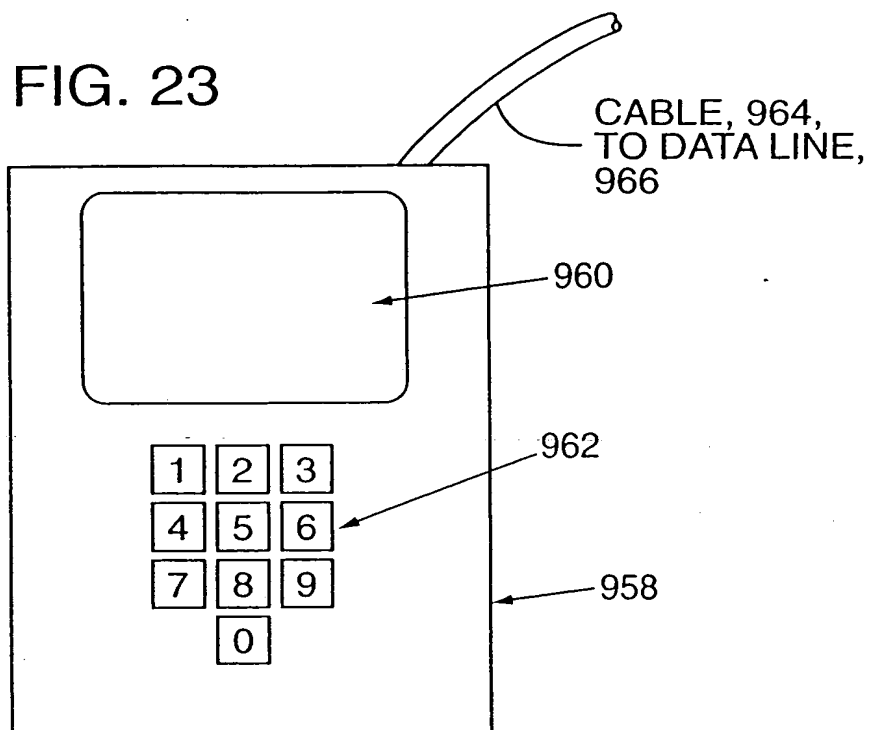




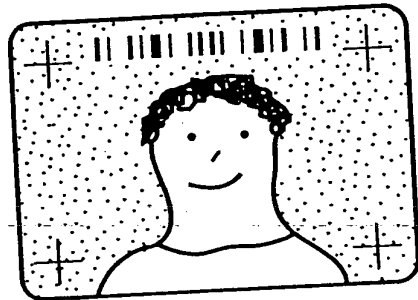
FIG. 23



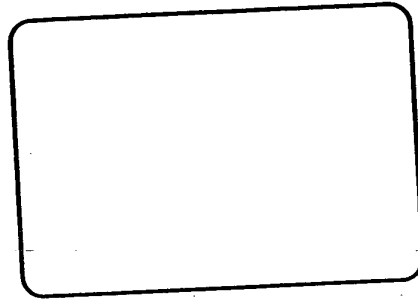
CONTAINS RUDIMENTARY OPTICAL SCANNER,  
MEMORY BUFFERS, COMMUNICATIONS DEVICES,  
AND MICROPROCESSOR

CONSUMER MERELY PLACES CARD INTO WINDOW AND CAN, AT THEIR PREARRANGED OPTION, EITHER TYPE IN A PERSONAL IDENTIFICATION NUMBER (PIN, FOR ADDED SECURITY) OR NOT. THE TRANSACTION IS APPROVED OR DISAPPROVED WITHIN SECONDS.

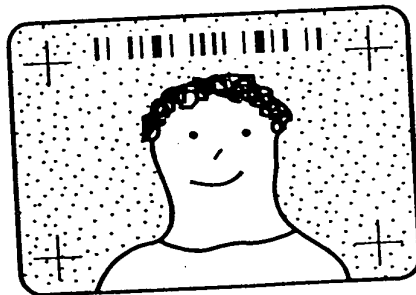
FIG. 24



ORIGINAL DIGITAL IMAGE WITH  
BARCODE AND FIDUCIALS  
ADDED, 970



COMPUTER GENERATES MASTER  
SNOWY IMAGE 972, WHICH IS  
GENERALLY ORTHOGONAL TO  
ORIGINAL IMAGE AT LEFT



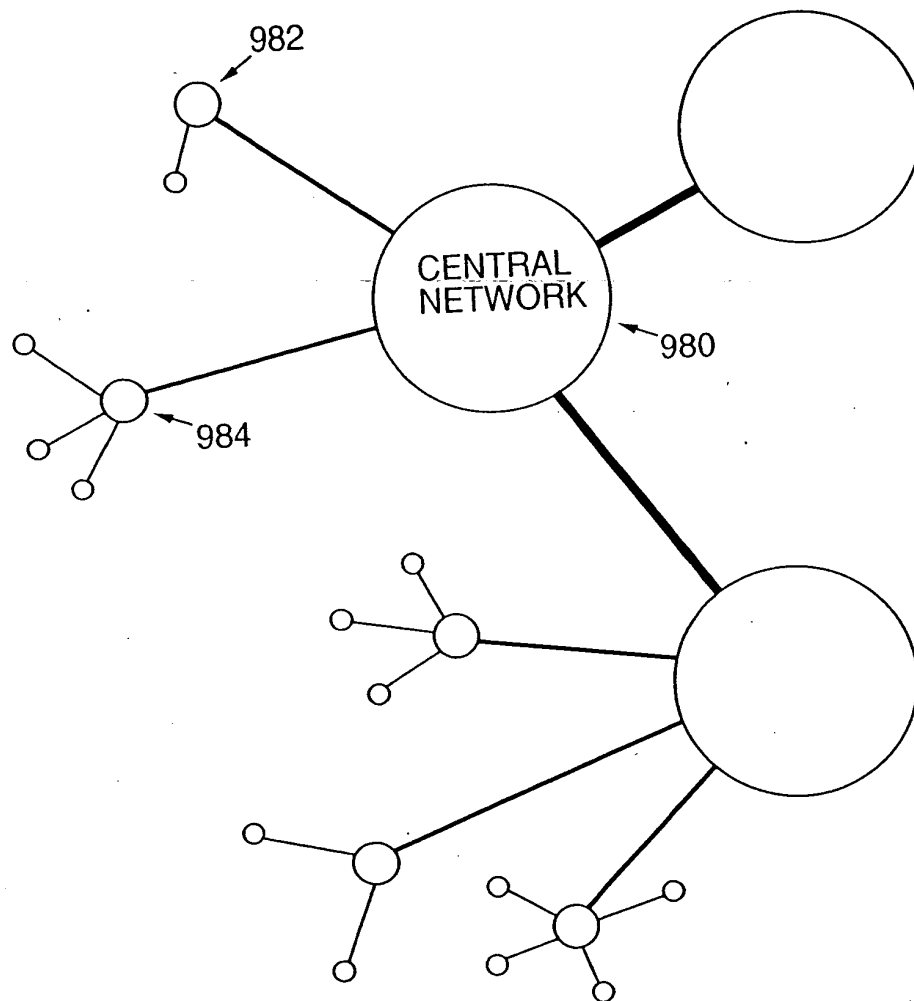
COMBINED TO FORM PERSONAL CASH CARD, 950

007650 9225560

## FIG. 25 TYPICAL TRANSACTION STEPS

1. READER SCANS IMAGE ON CARD, STORES IN MEMORY, EXTRACTS PERSONS ID
2. OPTIONAL: USER KEYS IN PIN NUMBER
  3. READER CALLS CENTRAL ACCOUNT DATA NETWORK, HANDSHAKES
  4. READER SENDS ID, (PIN), MERCHANT INFORMATION, AND REQUESTED TRANSACTION AMOUNT TO CENTRAL NETWORK
  5. CENTRAL NETWORK VERIFIES ID, PIN, MERCHANT INFO, AND ACCOUNT BALANCE
  6. IF OK, CENTRAL NETWORK GENERATES TWENTY-FOUR SETS OF SIXTEEN DISTINCT RANDOM NUMBERS, WHERE THE RANDOM NUMBERS ARE INDEXES TO A SET OF 64K ORTHOGONAL SPATIAL PATTERNS
  7. CENTRAL NETWORK TRANSMITS FIRST OK, AND THE SETS OF RANDOM NUMBERS
8. READER STEPS THROUGH THE TWENTY-FOUR SETS
  - 8A. READER ADDS TOGETHER SET OF ORTHOGONAL PATTERNS
  - 8B. READER PERFORMS DOT PRODUCT OF RESULTANT PATTERN AND CARD SCAN, STORES RESULT
  9. READER TRANSMITS THE TWENTY-FOUR DOT PRODUCT RESULTS TO CENTRAL NETWORK
  10. CENTRAL NETWORK CHECKS RESULTS AGAINST MASTER
  11. CENTRAL NETWORK SENDS FINAL APPROVAL OR DENIAL
  12. CENTRAL NETWORK DEBITS MERCHANT ACCOUNT, CREDITS CARD ACCOUNT

**FIG. 26**  
**THE NEGLIGIBLE-FRAUD CASH CARD SYSTEM**



A BASIC FOUNDATION OF THE CASH CARD SYSTEM IS A 24-HOUR INFORMATION NETWORK, WHERE BOTH THE STATIONS WHICH CREATE THE PHYSICAL CASH CARDS, 950, AND THE POINT-OF-SALES, 984, ARE ALL HOOKED UP TO THE SAME NETWORK CONTINUOUSLY

001E90:92258560

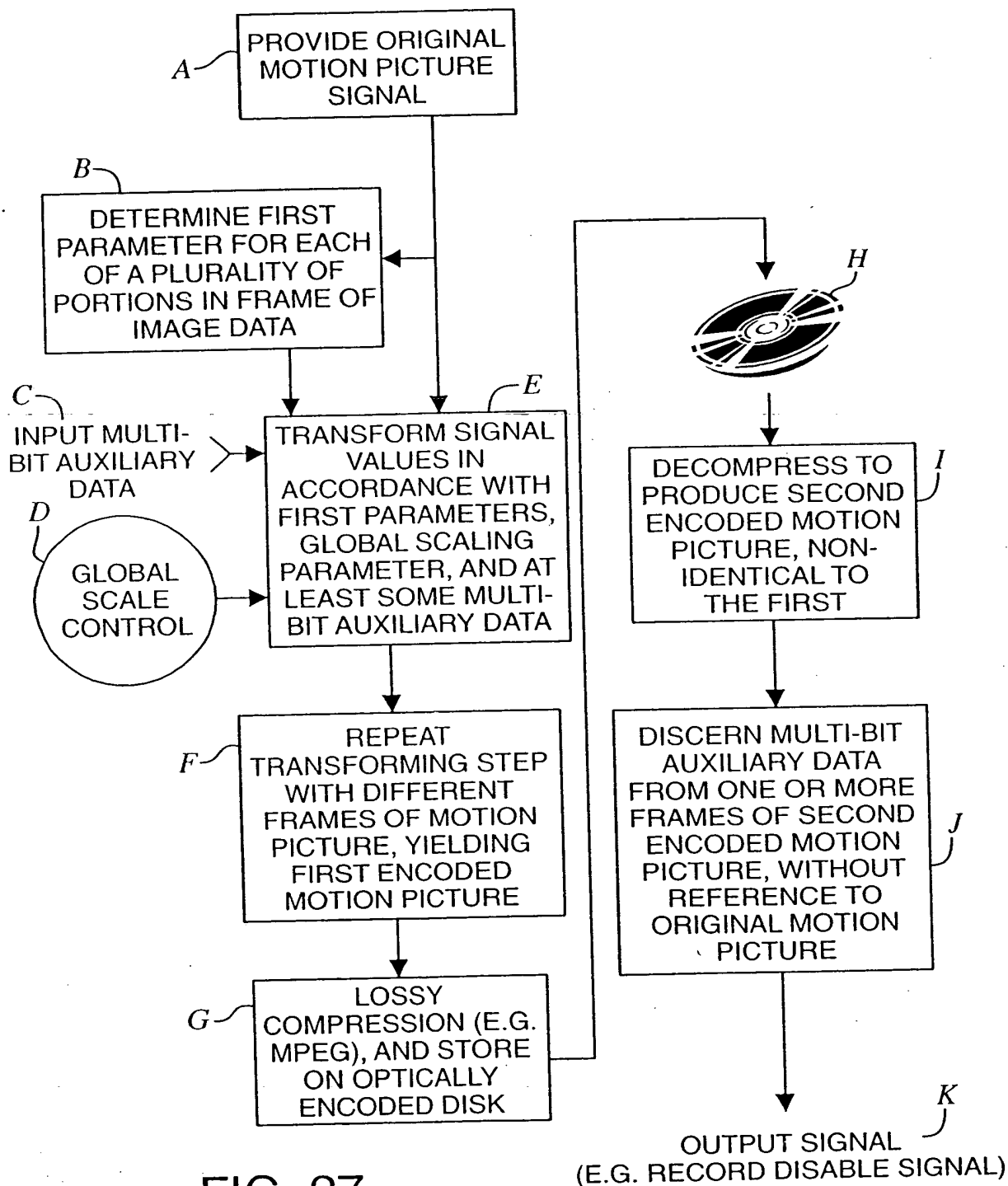


FIG. 27